mForms 2.4

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1 - Getting started

mForms v2.4 Features

We keep adding new features to our mobile client, while stlil maintaining our support for low-end phones. In mForms 2.0 you will find:

All the existing features

- User-based authentication
- Off-line data collection
- Support the following data types on all phones: Text, Integer, Decimal, Single Select (select only one option), Multiple Select (check all that apply), Boolean (Yes/No), Date, Time, Date & Time, Repeat (a group of questions which can be repeated), Picture, Video, Audio, Single Select Dynamic (see Glossary),
- If your phone has, you can collect GPS location data
- Support for validation and skip logic
- Support for a wide-range of low-end java phones http://doc.openxdata.org/all-versions/977

Plus

- A log of all uploaded data
- The ability to download data you have submitted and re-edit it
- Support for calculations
- Support for complex expressions - complicated skip logic and validation (currently requires a little tinkering on the server side, but you mobile users don't need to worry about this)

Compatible phones & compatible servers

To run openXdata, your phone, at the least must be able to run java applications. These phones are often called "feature phones." They usually cost $20 and up.

Basic requirements

The current main mobile client for openXdata requires CDLC-1.1, supported by most recent phones.

However, the standard is not always implemented in the same way, so different phones have varying performance.

Phones that work

cMost current openXdata users are using Nokia phones as they're widely available and often inexpensive.

We can't test all phones, **so we greatly appreciate other user experiences.**

Phones that we know work:

Nokia Series 40 phones:

- Nokia 2700c
- Nokia 2710c aka 2710 Navigator Edition (has GPS)
- Nokia 5130c aka 5130 Xpress Music
- Nokia 2600c
- Nokia 6700c (has GPS)
- Nokia 3110c
- Nokia 6131 NFC
- Nokia 6220c (not great design for inputting data)
- Nokia 1680 (price <$50)
- Nokia 6020
- Nokia 5230
- Nokia C1

All the above have been used in the field, so as far as we can tell all Nokia S40 phones work fine (see the note in Troubleshooting about setting up your GPRS connection settings).

Other phones known to work:

- E71

- Sony Ericsson P1i

It has been reported that many Samsung models and some LG models also have suitable j2me support.

Partially working

- Motorola RazR – application will install but runs v. slowly (based on one test – other feedback welcome)

Known not to work

- Sony Ericson – w350i

Server compatibility

openXdata is generally released in recommended pairs e.g. server 1.16.X is paired with mForms 2.4.X

However, if you wish to use older versions of the mobile client you can, we maintain forward compatibility. So mForms 1.7 will work with openXdata server 1.16.X. However, we do not maintain backwards compatibility, so mForms 2.4.x will not work with openXdata 1.3.X

Installing on your phone

Installing the openXdata mForms mobile client on your phone is the same as installing any other application. Of course, that may not be much help! There are four ways to do this:

- bluetooth (probably the easiest)
- SD card (if your phone has it)
- cable (if your phone has it)
- from a browser (works for all phones but your project administrator needs to set it up)

These instructions contain a lot of "in general" and "usually" - this is becaues mobile phones vary widely in their menus and functionality - referring to your user manual will usually help!

Bluetooth

You need:

- Bluetooth on your phone
- Bluetooth on a computer - built in or through a bluetooth dongle

The general process is:

- Pair your computer and your phone
- In you computer find the "Send files" function and send the .jar file to the phone
- Accept the file transfer on your phone

After the transfer, look for the application on your phone - it will often be under Games

SD Card

You need:

- Your phone to have an SD card slot
- An SD card that fits in your phone - usually microSD (https://en.wikipedia.org/wiki/Secure_Digital)
- Usually some kind of adaptor so you can use the microSD card like a USB stick on your computer

The general process is:

- Plug the microSD card into your computer so it appears as an external drive, like a USB stick
- Copy the .jar file onto the SD card
- Eject from your computer
- Put your SD card into your phone
- Find the app on your phone

The mForms app will usually run from the SD card, but you also should be able to copy it onto your phone if you want to use the SD card for other file transfers.

Cable

You need:
- A phone with a data cable

The general process is:
- Plug the cable into your phone and your computer
- On your phone it may ask you what kind of connection you'd like to make - choose Data or Storage
- Hopefully, your phone will appear as an external drive on your computer
- Copy the .jar to a place that looks right on your phone

Definitely one to check the manual. You may need software installed on your computer too.

From the phone's browser

This will work for all phones and if your user is remote from you. If your phone does not have an internet browser, it is likely that it cannot support openXdata mForms client. If you can't access the web, you may need to set up your phone to do so - which is also necessary for getting the mobile client to work.

You need:
- Your project administrator, will need to put the mobile client in a publically accessible location

To install:
- On your phone's web browser, go to the address you've been given for the jar - this can usually be the direct link to the jar e.g. http://www.openxdata.org/wp-content/uploads/openxdata-demo.jar
- The phone's browser should prompt you to save it and optionally open it.

Running the first time

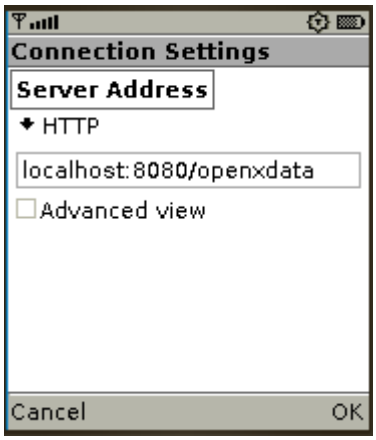
The first time mForms runs on a phone, the user will see some additional screens by default,

First time login

The application is designed to be used offline, so user names and passwords are stored in the phone so that a user can login even when she doesn't have a cell phone signal.

However, the first time you login, the phone has no knowledge of the users on the server. So the first time you login, only the first time, the login screen will accept any username and password - these are later checked once you have confirmed the server details on the next screen.

Confirm connection settings



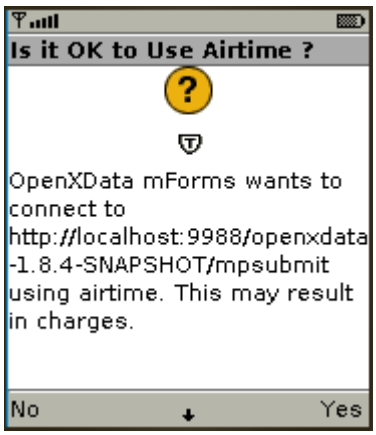
This is only presented to the user on the first login, afterwards the Connection Settings are available through the Settings menu.

You can confirm or edit the server settings.

For more information, see the Settings section.

Project administrators may also want to change this default URL before loading the mobile client onto the phone - for more information see Configuring the server URL

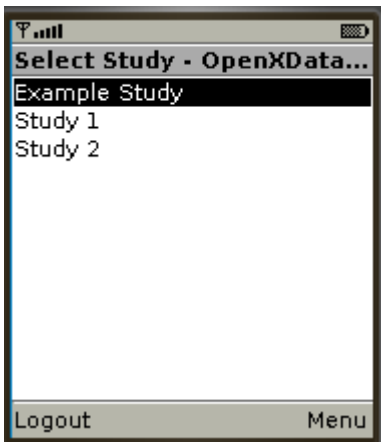
Application confirms user password and downloads list of studies assigned to user


Is it OK to Use Airtime ?
OpenXData mForms wants to connect to http://localhost:9988/openxdata-1.8.4-SNAPSHOT/mpsubmit using airtime. This may result in charges.
No
Yes

Every time the application needs to access the internet, the user will be asked to confirm whether to allow the connection. This is something the phone does, not the application and we cannot change. Experience may vary from phone to phone.

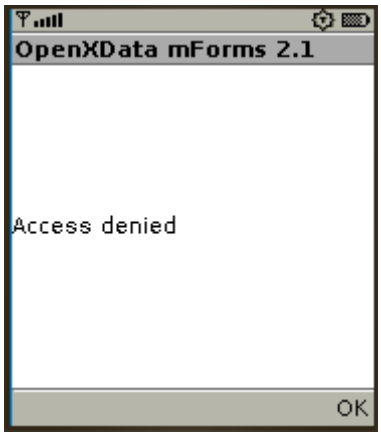
1. You must click yes to continue

User is presented with the list of Studies



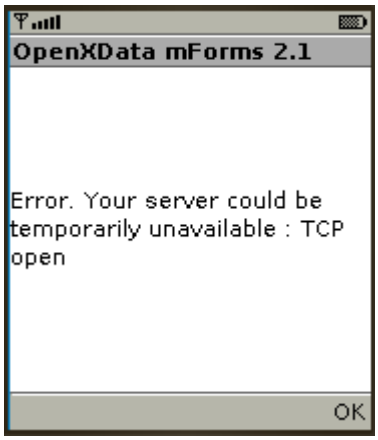
This is the screen that the user will now see each time they log in

What if I enter the wrong username / password?



If you enter the wrong username or password, you will see an Access denied message. Pressing ok will return you to the login page you will then have the opportunity to enter a correct username and password.

What if I enter the wrong server address?



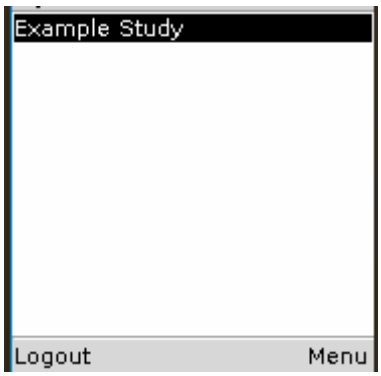
If you enter the wrong server address, you will see an error message. You will then be returned to the login screen, and then once again to the connection settings screen.

Note: In the unlikely even that you enter a valid openXdata server address, but not the correct openXdata server address then the application will think that you have an incorrect username and password and you will be taken back to the username and password screen but will not be shown the Connection Settings screen again and you will not be able to login. In this case you will need to delete the app from your phone and reinstall.

2 - Using the application

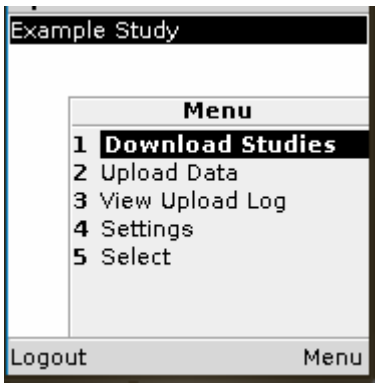
Downloading studies and forms

List of Studies



After logging in, the first screen is always the List of Studies.

Download studies



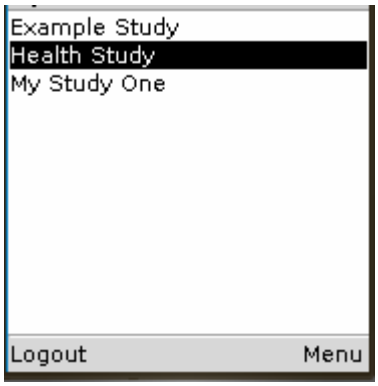
To download studies to your phone click Menu and Download Studies. You will need mobile signal and a data connection to download studies.

You may wish to download studies to:

- update your list after new studies were added
- update your list ater permissions were updated
- update your list if sharing a phone with someone

You will not be able to download studies if there is data on the phone waiting to be uploaded.

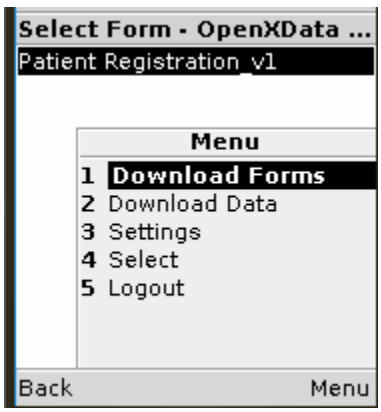
Download forms in a study



From your list of studies, scroll up and down and select the one you want, then press the middle button on your phone to select that study (or choose Menu -> Select).

If you have already downloaded the forms for that study, this will take you to the list of forms. If you have not yet downloaded the forms for that study, then you will need mobile signal and a data connection to download the studies.

Updating forms



If you are in your list of forms and you wish to update the list of forms. You can download the forms again for that study by using Menu -> Download Forms

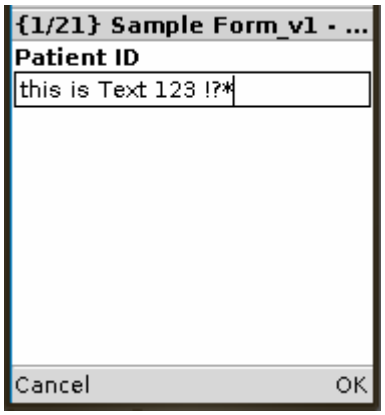
Permissions

Remember you will only be able to see the studies and forms that your user has been granted access to. See server documentation for instructions on assigning studies and forms to users.

Entering Data

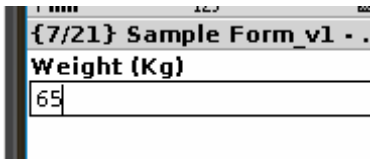
Entering data on the phone is very self explanatory. The best way to learn is to try entering data a few times on the sample form that comes with a default openXdata implementation.

Text question



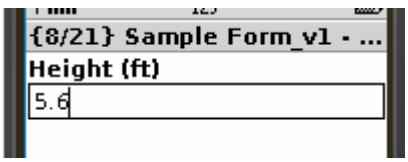
Text questions will take all values using your phone's standard input - whatever language your phone's writing settings are set to is what will appear here.

Number



Number questions only accept integers, like 65, not decimals like 65.3. Your phone will be forced to enter numbers on number fields. Negative numbers are accepted

Decimal



Deciml accepts both integers and decimals. Your phone will be forced to enter numbers. Negative numbers are accepted.

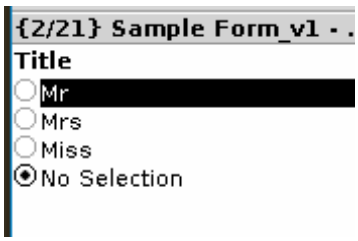
Date

Date questions will allow you to enter a date manually. But there will also usually be a Select Day option presented in the bottom menu which will bring up a calendar as shown above.

Time

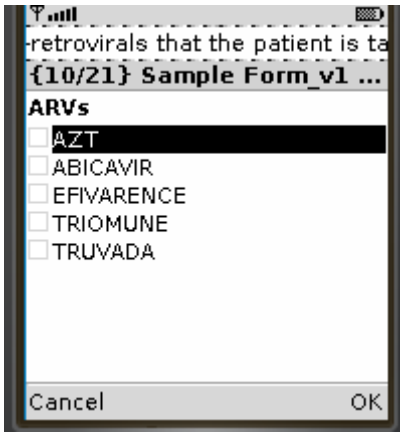
A time question will force the user to enter numerical values for hour and minute

Boolean / Single Select



On a single select, the default selection will be No Selection (unless you've specified a default in your form definition). Scroll up and down to select the value you want.

Multi Select

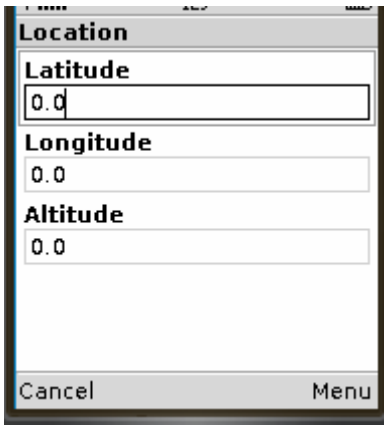


On a multi-select, use the middle key on your phone to select all the values that apply. In this screenshot, you can also see the help text that can be set in the form designer scrollign along the top of the mobile screen.

Repeat Question & Multimedia

Repeat and Multimedia questions are covered in seperate sections: Repeat questions

GPS



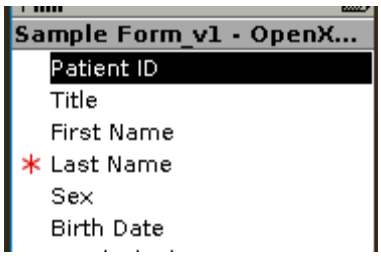
If your phone has GPS, and mForms can detect it, when you click the GPS question, you will be asked for permission to use the GPS. There is no way to circumvent this, the user must agree to use the GPS. Once GPS co-ordinates have been determined, they will be shown in the question.

If your phone does not have GPS, you will be given a screen to enter co-ordinates manually

Single Select Dynamic

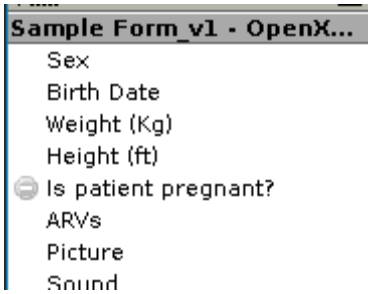
Single select dnyamic questions look just like single select questions except that no options will be presented to the user until the preceding questions are entered. E.g. if you have a single select dynamic question Country, that presents a list of countries based on the Continent previously selected, until Continent is selected, no Countries will display in the question.

Required



Required questions are marked with a * (red asterisk)

Disabled



Disabled questions are marked with a grey stop sign.

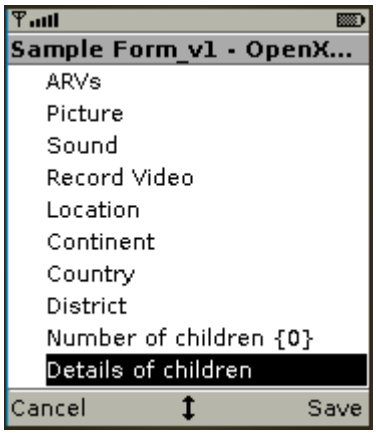
Locked

If a locked question is enabled, you will be able to enter the question, but not enter data. Depending on the phone, the phone may show a lock symbol when you attempt to enter data.

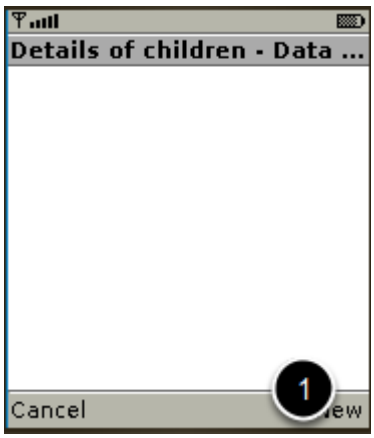
Repeat questions

Using the Example Form, in the Example Study we look at how to use repeat questions on the mForms client.

Open the repeat question "Details of Children"



You are presented with a blank screen



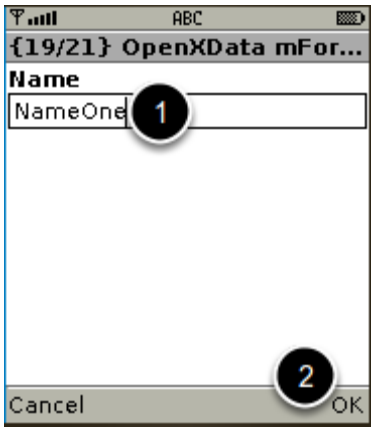
This blank screen will contain a list of all of the groups of questions you have added, as you add them. For now, it is empty.

1. Click New

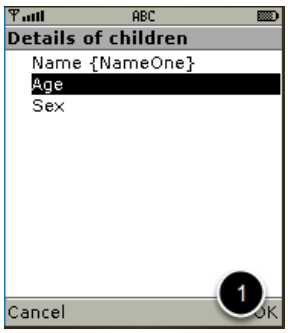
You now have the questions that are in the repeating group

Note that as no information is added only "Cancel" is available as an option

Add information to each question



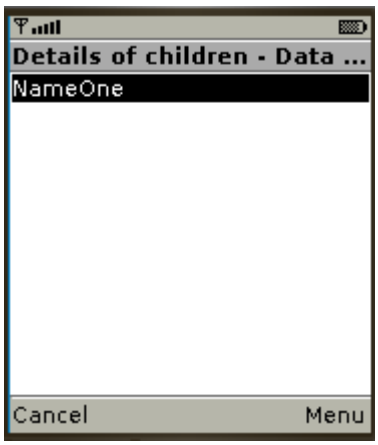
The list of questions now has OK option



After entering data for some or all of the questions, the OK option has appeared on the Right Option

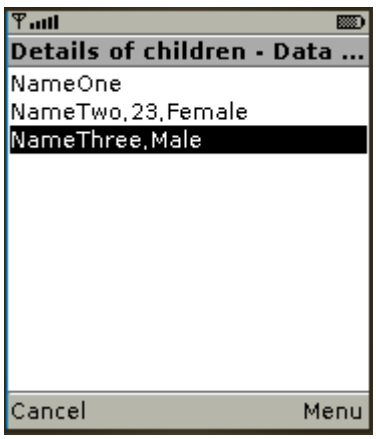
Click OK

Now add more repeat question data (or return back to main form)



You now have a list of the data you entered. From here you can use the "Menu" button to add new data, delete a data set you've added or return to the main form.

Added some more data rows



In the above shot I have entered three seperate groups of answers to the repeat question.

Group 1
Name: NameOne
Age:
Sex:

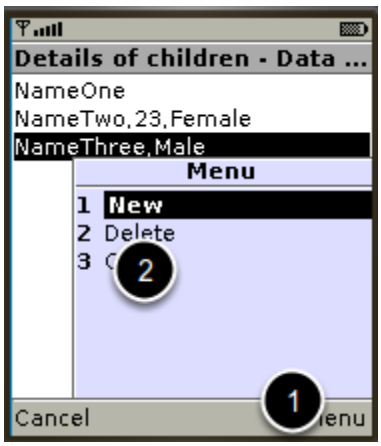
Group 2
Name: NameTwo

Age: 23
Sex: Female

Group 3
Name: NameThree
Age:
Sex: Male

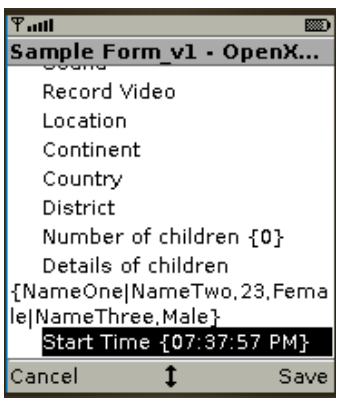
You can also go up and down this list and select a row, to return and edit it.

To return to the main form



1. Click Menu
2. Click OK

Repeat data is now displayed in main form



The different rows are seperated by |

Note there is currently a ticket, to change the display on the main form from this to simply a

count of the number of groups of repeat data entered.

Multimedia questions (Audio, Video, Image)

Audio, Video and Image questions are available if the phone supports them.

User permission

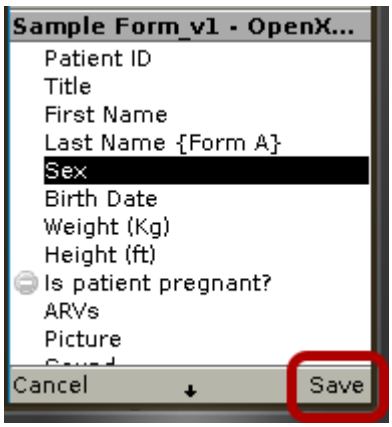
When you enter a multimedia question the user will typically be asked for permission to access this feature of the phone.

Problems saving large videos

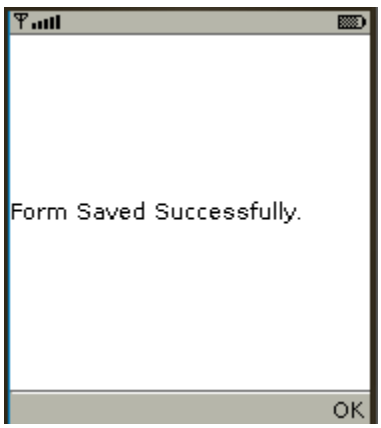
There is a known bug (https://trac.openxdata.org/ticket/842) when you try to save video larger than your phone can handle which may well cause mforms to crash.

Saving forms (including partially completed forms)

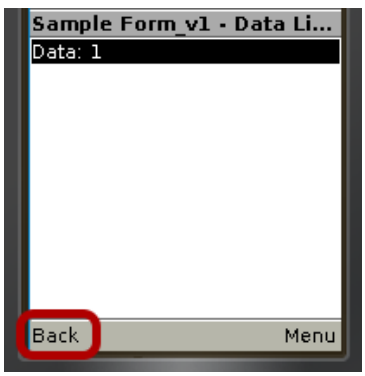
Saving Data



Once you have entered all the data into your phone click Save

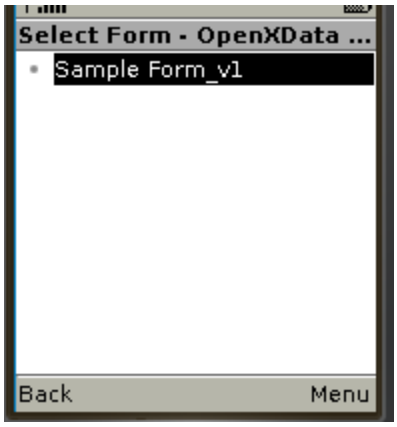


New list of data is started

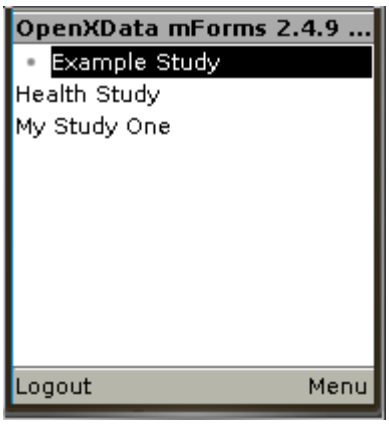


A list of data saved for that form will now be started. If you press Back from this screen, you will taken back to the list of forms.

Saved data indicator

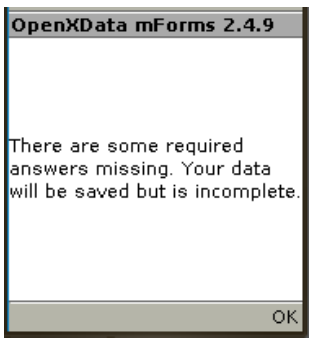


You will be returned to your list of forms but there will now be a small grey dot indicating that data is saved for that form.

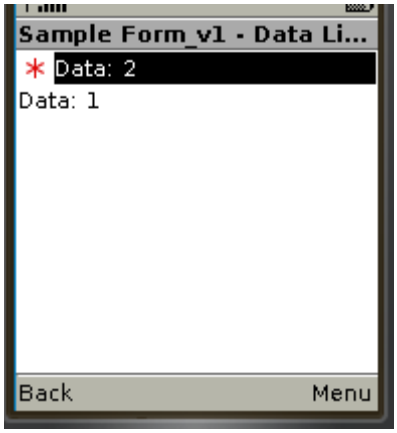


This indicator is also present on the list of studies

Saving partially completed forms



If a form has required data that has not yet been entered, you will be able to save the form, but you will not be able to upload it.



Partially completed forms are then marked with a * to indicate that required data is still left to be completed.

View your saved data

To edit your data or complete your form, simply select the row you wish to edit and you will be returned to the form.

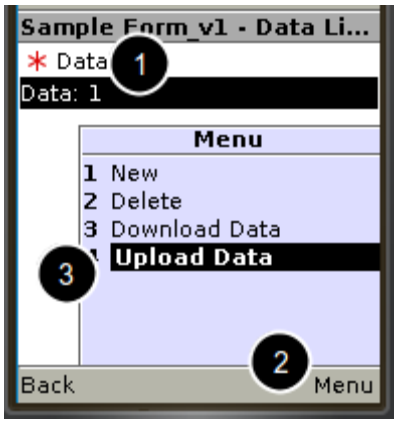
Uploading & Downloading data

Data can be uploaded from two levels in the mforms client:

- Study view - bulk upload
- Data view - individual upload

You need a mobile signal and a data connection to upload and download data

Upload - data view

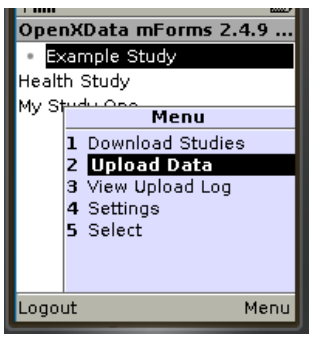


From the data view we can select individual forms to upload, which is useful if you have some forms currently incomplete

When uploading from the data view, you can upload one form at a time. To upload:

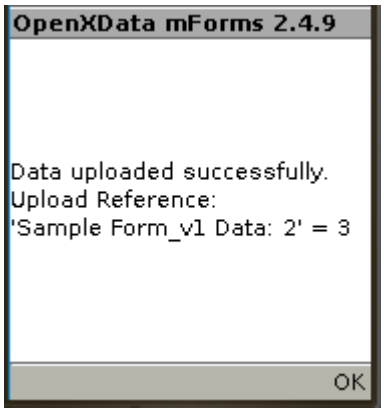
1. Highlight the form you want to upload
2. Click menu
3. Select Upload Data

Upload - study view



Selecting upload from the study view will upload all saved data that is complete, but will leave any partially completed forms on the phone.

Upload Reference

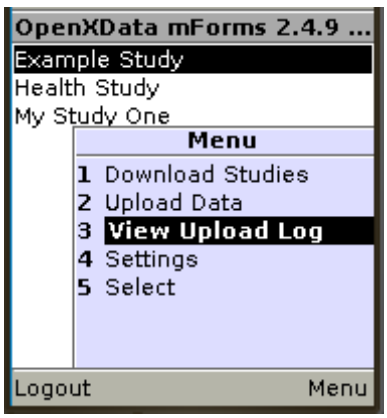


When the data is uploaded, a confirmation message will appear on the phone. With this confirmation message will be an upload reference for each form that was successfully uploaded. This same ID can also be seen in the View Responses window on the server.

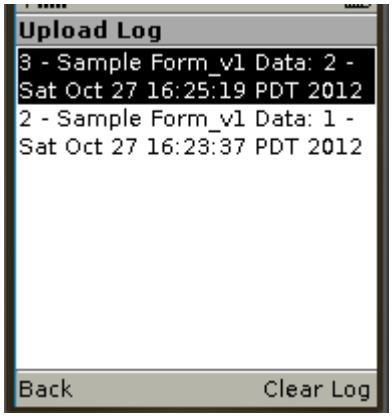
Deleting uploaded data

By default, successfully uploaded data is deleted from the phone. This can be changed in the phone's settings menu

Upload Log



From the studies screen, you can select View Upload Log

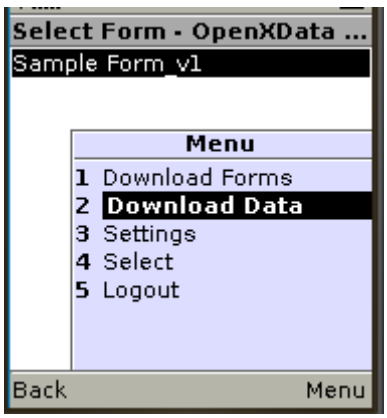


The upload log gives a list of all data that a user has uploaded. For example, in the above screenshot:
3 - Sample Form_v1 Data: 2 - Sat Oct 27 16:25:19 PDT 2012

This means the following:

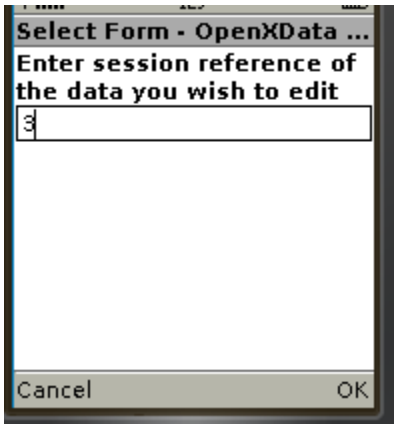
- 3 - this is the upload reference
- Sample Form_v1 - this is name of the form
- Data: 2 - this is the name of the form that was on the phone
- Sat Oct 27 16:25:19 PDT 2012 - this is the time and dat of upload

Downloading data



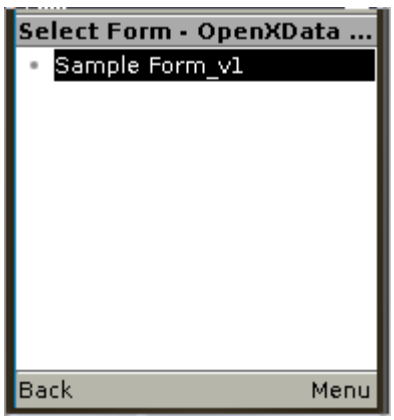
From the form view, you can download data that you have previously uploaded

Downloading data - enter session reference



The Download data screen asks you to enter the session reference for the data you want download. The session reference is the same as the upload reference.

You can only download data you uploaded yourself.



Once the data is downloaded, you will see the data indicator again and you can edit the data.

Audit / Edit Trail

The database for the server tracks all edits to forms. There is currently no front-end way to view this, but it is possible to retrieve all the changes that were made to data and when.

Working offline

mForms is offline by default, connecting only when it needs to

mForms is offline most of the time. It connects to the server :

1. Confirm a username / password if it is the first time a user has logged in
2. Download studies (on first time login, or by user request)
3. Downlad forms (by user request)
4. Upload / Download data
5. Re-confirm a user after 3 failed attempts at login (see password resets)

To use mForms offline, you do not need to do anything. Before your phone users leave mobile coverage range, make sure they have logged in and downloaded the forms they will need to complete their work.

Once the forms are downloaded onto the phone, they will be able to collect data until their phone runs out of storage space (this is typically a lot of forms).

When they are back in mobile range they can upload the data they have collected.

mForms does not automatically upload data

Don't forget, because mForms is offline by default, users must upload the forms they have completed.

3 - For project administrators

Configuring the server URL

When you go live with a project, you may not want to manually edit the server URL on every phone. You can edit the .jar (the mobile client) file before putting it on the phone so that your server URL is the default URL in the mobile application.

To do this you will need java installed on your desktop machine where you are editing the .jar

Open a terminal / command prompt:

- Windows: from the start menu, go to run a program and type cmd
- Mac: Terminal is in the utilities
- Linux: gnome-terminal / xterm / terminator etc.

From the command prompt type:
$ java -version
If you see something like
java version "1.6.0_32"
Java(TM) SE Runtime Environment (build 1.6.0_32-b05)
Java HotSpot(TM) 64-Bit Server VM (build 20.7-b02, mixed mode)
you should be able to update your jar.

Extract the default.properties file from the jar

At the command prompt, navigate to the location of your mobile client - e.g. mforms-midlet-2.4.8-me.jar

$ jar -xf mforms-midlet-2.4.8-me.jar defaults.properties

(Don't forget to use your midlet name)

This extracts the defaults.properties file from your jar and you should now see it in the folder you are in with your mforms-midlet-2.4.8-me.jar. If you omit defaults.properties from the end of the command it will extract the entire contents of the jar which is a lot of files but is fine and you can continue with the following instructions

Edit the default.properties file

Open default.properties in your favorite text editor (not Word) e.g. notepad, gedit

It should contain one line:

httpUrl=http://localhost:8080/openxdata/mpsubmit

Edit this to be your server - do not forget the /mpsubmit at the end of the URL for example:
httpUrl=http://www.myopenxdataserver.net:8080/webapp-1.16.7/mpsubmit

When you are finished, save this file back to where you opened it

Update your jar with your new defaults.properties

At the command prompt, navigate to the location of your mobile client again

$ jar -uf mforms-midlet-2.4.8-me.jar defaults.properties

This is the same as before but with -uf instead of -xf

(Don't forget to use your midlet name)

Done!

Copy your jar onto your phone and you should now have a new default URL.

Users: new logins, password resets

What happens when:
1) A new users wants to login to the mobile client when another user has previously been using it
2) you reset the password for a user

New user login

When a new user wants to login, the application needs to connect to the server to verify the username and password as well as the user's permissions.

So make sure that the first time a new user logs onto the phone application, you have cellphone signal. After this initial login, the user will be able to access the application and collect data as normal.

IMPORTANT SECURITY CONSIDERATION: When a new user logs into the phone, any information stored on the phone will be available to the new user until the new user tries to download new studies or perform another action that connects them with the server.

Studies, forms, and data already entered will be available. However, users will not be able to upload data to a study they don't have access too.

NOTE: mForms 2.13 and higher has enhanced security that corrects this issue

Workaround to ensure this isn't a problem:
1) Have in place a system that means when a phone transfers between users that the previous owner confirms that they have uploaded all their data
2) On new user login, make sure the first activity is to Download Studies - this will reset everything.

Password reset

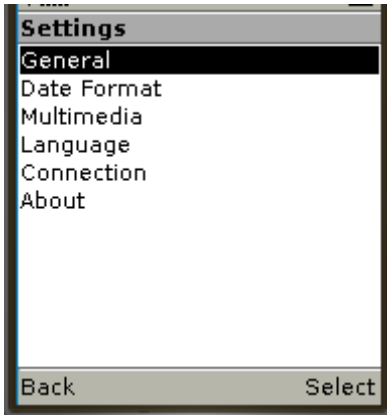
Because the application is designed to run offline, passwords are stored locally and so the user will continue to be able to login to their phone even when you've reset their password at the server level. However, as soon as a password has been reset at the server level, the phone user will not be able to upload or download data - they will get an access denied message.

To force the phone to re-check the server, the user must:
1. Go to the login screen
2. Enter their new password upto three times. They will get a message "Invalid username or

password" until the phone reconnects to the server to get the new list of passwords.

The user will need to have mobile signal and a data connection to reset their password.

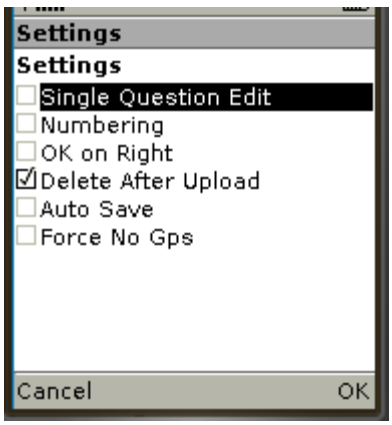
Settings



The settings menu can be accessed from most screens in the mForms application.

- General - this contains settings about how mForms displays forms
- Date Format - override the phone's default date settings
- Multimedia - Multimedia settings
- Language - this menu is non-functional
- Connection - change the connection settings
- About - information about the mForms client you are running

General

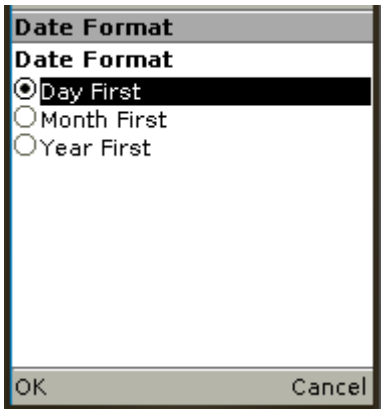


- Single Question Edit - in this view when you are entering data into a question, you can click Next and go straight to the next question instead of saving an answer and going back to the list of questions
- Numbering - this automatically adds numbers to each question in the form for you
- OK on Right - makes sure that the OK menu button is always on the right
- Auto Save - when entering data into a form, from the list of questions there is a cancel option. With auto save selected this will just take you back to your list of forms and your data

will be saved. Without it, you will be prompted to save or not before leaving the form.

- Force No GPS - This setting will prevent a GPS question from accessing the phone's GPS functionality (if it has it) and always show the screen to manually enter GPS data

Date Format



Multimedia

You can use the multimedia settings to enforce specific encoding formats.

In addition, if your phone's camera has a high resolution and you want to limit the amount of data uploaded, you can edit the settings to capture only a smaller image size. To control the size of the photo taken, you can use the Multimedia settings on the mforms client.

You must set the encoding, width and height for this to work.

- Picture Format eg jpeg = jpeg
- Picture Width eg 320 = 320
- Picture Height eg 240 = 240

Notes:

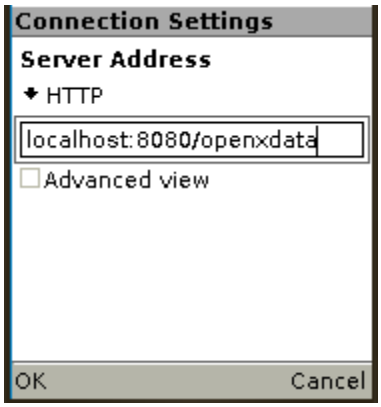
- Picture format must be exactly "jpeg" and must be supported on your phone. Check the encodings for your phone model
- Set Picture format to "jpeg&quality=25" to reduce the size of the picture taken even further. You will see pixelization at this quality.
- At these settings the xml should be around 17 kilobytes, and the picture itself (unencoded) around 11 kilobytes.

Language - non functional

The language menu is currently non-functional. It is being developed as part of https://trac.openxdata.org/ticket/732

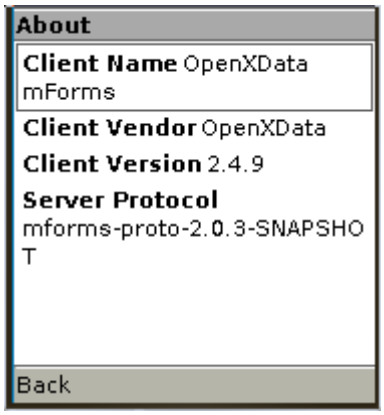
To change the language of the application, see Changing the application language

Connection Settings



The connection settings menu will take you to the same connection settings screen that you saw on first login.

About



The About screen will give you information about the version of the midlet that you are running which may be of use to project administrators if they are trying to troubleshoot issues

Changing the application language

Changing the application language is about changing the menus and prompts in the mobile client. To do this, you will need to edit the language properties file. The process is very similar to changing the server URL.

To do this you will need java installed on your desktop machine where you are editing the .jar

Open a terminal / command prompt:

- Windows: from the start menu, go to run a program and type cmd
- Mac: Terminal is in the utilities
- Linux: gnome-terminal / xterm / terminator etc.

From the command prompt type:
$ java -version
If you see something like
java version "1.6.0_32"
Java(TM) SE Runtime Environment (build 1.6.0_32-b05)
Java HotSpot(TM) 64-Bit Server VM (build 20.7-b02, mixed mode)
you should be able to update your jar.

Extract the language properties file from the jar

At the command prompt, navigate to the location of your mobile client - e.g. mforms-midlet-2.4.8-me.jar

$ jar -xf mforms-midlet-2.4.8-me.jar menu_text.properties

(Don't forget to use your midlet name)

This extracts the menu_text.properties file from your jar and you should now see it in the folder you are in with your mforms-midlet-2.4.8-me.jar. If you omit menu_text.properties from the end of the command it will extract the entire contents of the jar. In this case you will also be able to see the menu_text_es.properties which is the spanish translation of the application that comes by default with the mforms client.

If you are running mforms on a spanish phone, the phone should detect the _es file and use the spanish version automatically

Edit the menu_text.properties file

Open menu_text.properties in your favorite text editor (not Word) e.g. notepad, gedit

It will contain many lines, this is a sample from menu_text_es.properties
SELECT=Seleccionar
MAIN_MENU=Menu Principal
SELECT_STUDY=Elija estudio
SELECT_FORM=Elija formulario
DOWNLOAD_STUDIES=Descargar estudios
DOWNLOAD_FORMS=Descargar formularios
UPLOAD_DATA=Cargar datos
DOWNLOAD_DATA=Descargar datos
SETTINGS=Configuraciónes
LOGOUT=Terminar sesión
LOGOUT_PROMPT=¿Desea salir de la aplicación?
GENERAL=General
DATE_FORMAT=Formato Fecha
MULTIMEDIA=Multimedia
LANGUAGE=Idioma
CONNECTION=Conexión

Edit this for your translations.

When you are finished, save this file back to where you opened it

Update your jar with your new menu_text.properties

At the command prompt, navigate to the location of your mobile client again

$ jar -uf mforms-midlet-2.4.8-me.jar menu_text.properties

This is the same as before but with -uf instead of -xf

(Don't forget to use your midlet name)

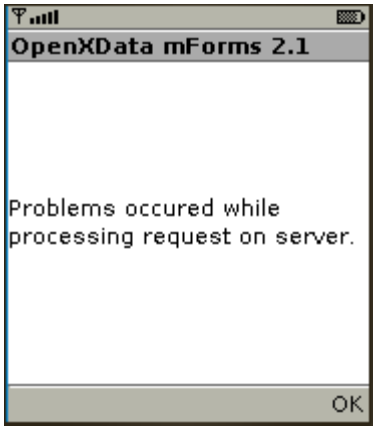
Check it woks

Copy your jar onto your phone and you should now have a new default menu.

Error messages & Troubleshooting

Description of error messages a user may see and what the problem likely is

Problems occurred while processing request on server



Causes:
1) User does not have the role Role_Mobile_User - will affect only this user
2) The mobile application is looking for a protocol that is not available on the server - will affect all users
3) User has tried to upload data to a study they don't have access to - will only affect this user

- This can happen when a user has logged into a phone that was previously used by another person, has used the forms that were already downloaded by that user, and has tried to upload. (See working Offline for more information)

Can also check the tomcat logs to confirm:
1) protocol error while handling request from client - org.openxdata.proto.exception.ProtocolException: failed to serialize users
2) protocol error while handling request from client - org.openxdata.proto.exception.ProtocolNotFoundException: Could not load protocol jar 'xxx' (where xxx is the name of the protocol the mobile client is looking for)
3) protocol error while handling request from client - org.openxdata.proto.exception.ProtocolException: failed to deserialize uploaded form data

Access Denied

Username or Password is wrong

User sees a blank screen after trying to download studies

No studies / forms have been assigned to the user

Problems saving large videos

There is a known bug (https://trac.openxdata.org/ticket/842) when you try to save video larger than your phone can handle which may well cause mforms to crash.